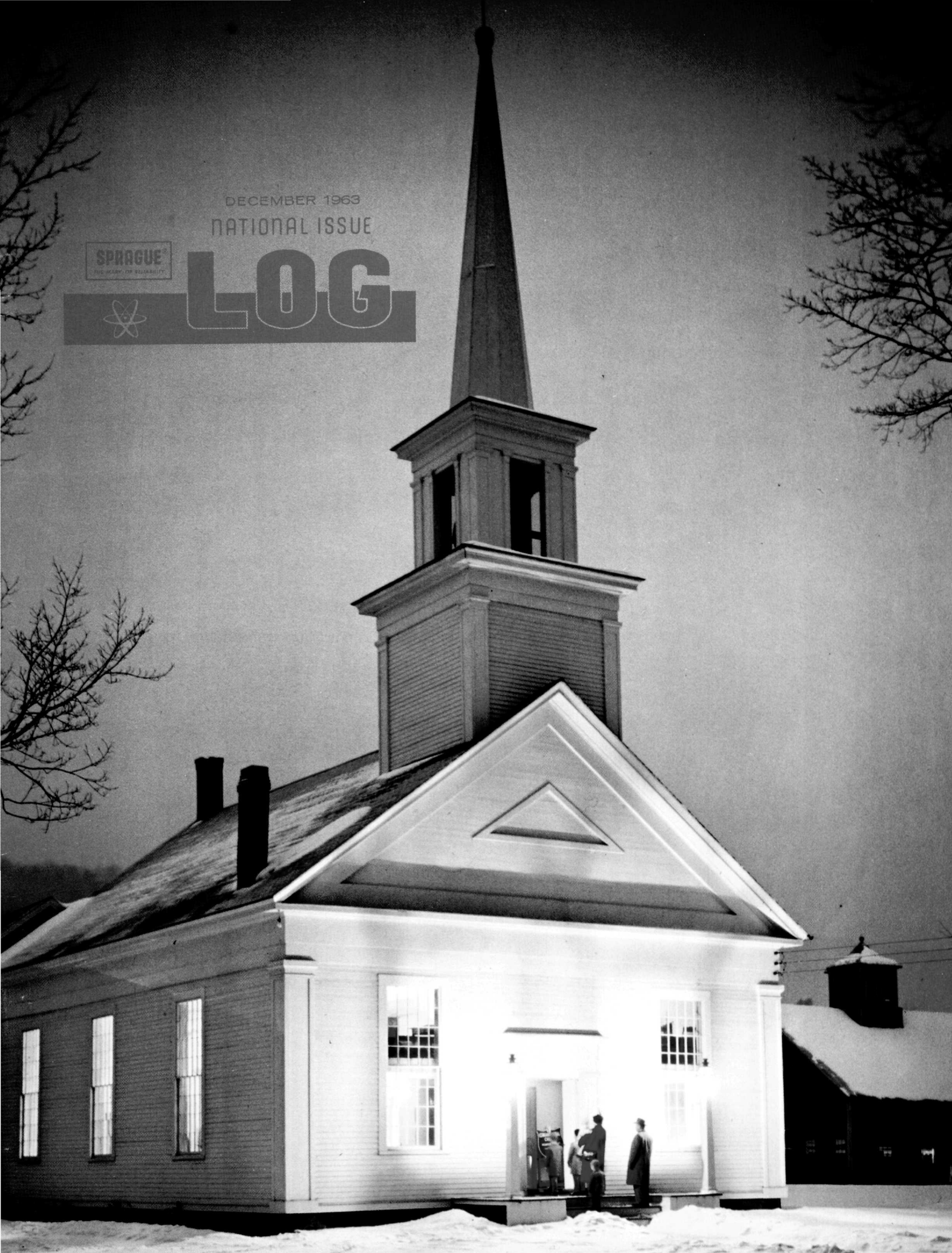
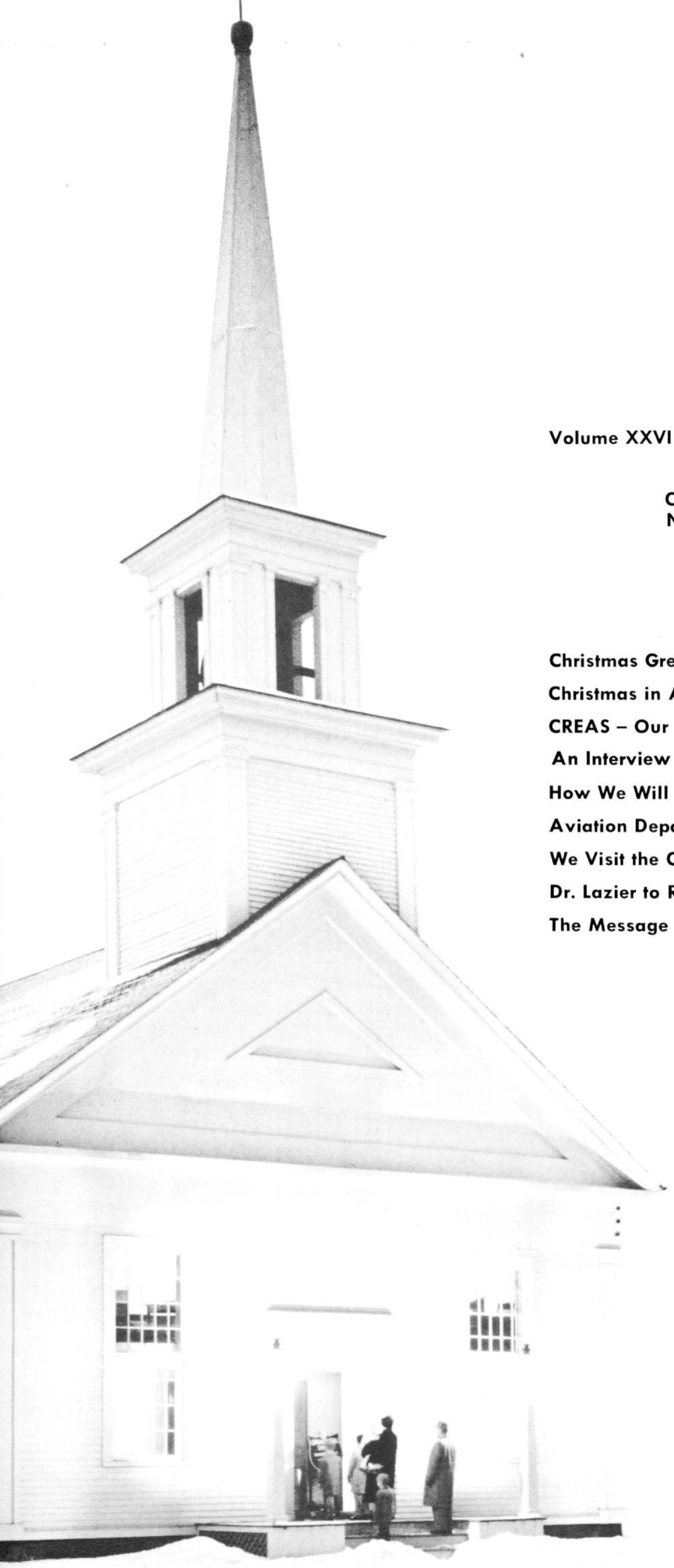

DECEMBER 1963
NATIONAL ISSUE
SPRAGUE
THE MARK OF RELIABILITY
LOG



SPRAGUE LOG
National Issue
Volume XXVI Number 2
Published
Sprague Electric Company
Corporate Industrial Relations
North Adams, Massachusetts

TABLE OF CONTENTS

Christmas Greetings from the Chairman of the Board 1
Christmas in America 2
CREAS – Our Company in Italy 4
An Interview with William J. Nolan 7
How We Will Get To The Moon 8
Aviation Department Honored 11
We Visit the Chicago Sales Office 12
Dr. Lazier to Retire on December 31 14
The Message of Medic-Alert 15

Dear Sprague Employe;

Christmas is traditionally a happy season with the cares of everyday living put aside temporarily, and everyone joining in the theme of "good will to all men".

As we review the year's events we can point with pride to significant technical advances made during the first full year of operations of our new Research Center. Our extensive efforts in the field of microelectronics have led to successful development of new solid state circuits which will play a very important role in the future of our whole industry, as well as in the future of Sprague Electric Company.

As the year draws to a close two of our valued senior officers will be leaving our ranks. William J. Nolan, Senior Vice President, Legal, one of the first employes of the Company and truly a guiding spirit over the years, will continue to serve on our Board of Directors and will give us the benefit of his long and extensive experience on a consulting basis. Dr. Wilbur A. Lazier, Senior Vice President in Charge of Engineering, who has been with us for ten years, is retiring. During his service with us our research and engineering facilities and programs have expanded tremendously. More detailed accounts of the contributions of both of these gentlemen can be found elsewhere in this issue.

As we review our activities for the year we find that our net sales will be down about $5 million in comparison with last year's sales of about $87 million. In an intensively competitive market we anticipate this year's sales will be in the neighborhood of about $82 million with a more than proportional decrease in net profits. This drop in sales volume and profits presents a challenge to each of us to lower costs and increase sales during 1964.

Recently we were all deeply saddened by the untimely death of President Kennedy. During this season let us rededicate ourselves to the high principles on which this nation was founded and offer our prayers to Almighty God for His help and guidance to President Johnson as he faces the trials and problems of the coming year.

It is my sincere wish that you and your families will enjoy a happy holiday season and a good New Year.

Cordially,

Robert C. Sprague

Christmas in the United States is many things. It is remembrance of the Child of Bethlehem. It is majestic church services and renewed spiritual lives.

Christmas also is family fun, crowded stores, gifts under the tree, wreaths, candles, bells, holly, mistletoe, and good things to eat. It is children's breathless anticipation, and it is quiet moments of peace.

The tapestry of American Christmas today is richly woven with threads of customs from every corner of the world.

Because it celebrates the birth of Christ, we think of Christmas as going back nearly 2,000 years. Actually, the celebration, as we know it in the United States, is relatively new. As a legal holiday in all states it dates

from 1890. No state recognized it until 1836.

Few Americans realize that major groups of American colonists objected to Christmas celebrations. New England Puritans were especially hostile toward such observances. Early records indicate that on December 25, 1620, their first Christmas in America, they worked on erection of a building in "studied neglect" of the day.

Following their great migration to New England in 1659, the Puritans enacted a law in the general court of Massachusetts to punish those who kept Christmas. The law read in part, ". . . . anyone who is found observing by abstinence of labor, feasting, or in any other way, any such days as Christmas Day, shall pay for every such offense five shillings."

In 1681 the law against celebration of Christmas was repealed, but many Puritan groups maintained their opposition for the better part of 200 years.

Though the Puritans outlawed celebration of Christmas, early colonists in other areas did not share their attitude. Folk celebrations were customary in New York City, Pennsylvania, and the southern colonies from the days of the earliest settlements.

These early Christmas celebrations followed customs brought from England, Holland, and Germany. They emphasized eating, drinking, family gatherings, and merrymaking during the season which began well in advance of December 25 and usually lasted through January 6.

Caroling was a Christmas folk custom in all three of these countries long before colonization of America, and it led toward exchange of other customs.

Germans who settled in Pennsylvania brought the Christmas tree tradition with them. An account of a Christmas celebration held in Bethlehem, Pennsylvania in 1747 states: ". . . several small pyramids and one large pyramid of green brushwood had been prepared, all decorated with candles, and the large one with apples and pretty verses."

Martin Luther often is credited with erecting the first Christmas tree. The story tells how one Christmas Eve he was struck by the beauty of stars twinkling through the evergreens. The sight was so appealing that he shared his feeling of wonder by taking a little evergreen into his home and placing candles on its branches to represent stars.

The English did not adopt the Christmas tree until after it was rather common in the United States, but they did contribute other customs to the American Christmas. Decorating with holly and mistletoe and serving many special foods are among these.

Their biggest contribution, however, was not a custom but what has been called "the carol philosophy" of Charles Dickens. Through "A Christmas Carol" and other writings, Dickens preached the virtues of brotherhood, kindness, charity, and generosity at Christmas — especially by those who have ignored or neglected those sentiments during the rest of the year. He also combined many religious and secular attitudes toward the celebration into a humanitarian pattern. The converting of Ebenezer Scrooge to a man "who honored Christmas in his heart" has become part of the folklore of Christmas.

Without the Dutch, our American Christmas might never have developed Santa Claus. The visit of Saint Nicholas was popular with both Roman Catholics and Protestants in Holland. Once transplanted to America it gained the same type of support.

In the Netherlands, Saint Nicholas arrived on December 5. Gift bringers in other countries arrived on various other dates, with December 25 and December 31 being most popular. As the custom was adopted by more and more people in the colonies the date was gradually shifted to Christmas Eve.

Clement Clarke Moore's poem, "A Visit From St. Nicholas", which appeared in 1822, probably did much to crystallize popular notions of the gift bringer and fix his folk character. Moore used the names Saint Nicholas, Saint Nick and Santa Claus interchangeably. He also changed his transportation from horse and wagon to a magic sleigh and tiny reindeer and firmly fixed the time of his arrival as Christmas Eve.

By the turn of the century, Santa Claus was almost universally accepted in the United States and personified the spirit of Christmas that embodied gifts, joy, and merriment.

As immigrants from each new country have arrived in the United States they have added rich, new elements to our Christmas celebration — both religious and secular. As a result the American Christmas has changed and adapted through the years.

It is a Christmas which is truly a testimony to the brotherhood of man, and the eternal hope of Christmas everywhere ". . . . Glory to God in the highest and on earth peace, good will toward men."

The plant seen from the corner Via Severoli-Viale Legioni Romane

Giacomo Giacomello
Administrator Delegate

CREAS-Our company in Italy

Main Entrance

Accounting Department

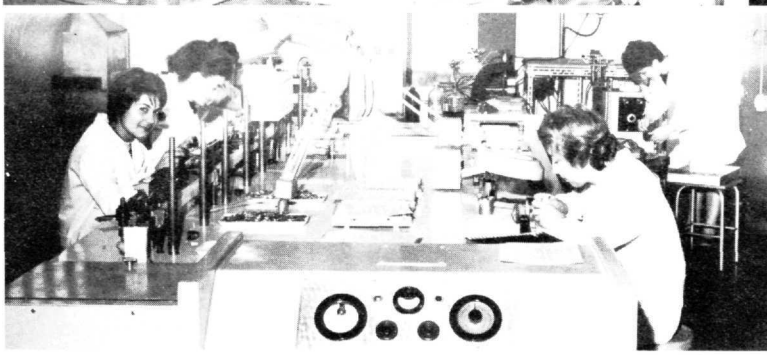
In the period following World War II the countries of Free Europe took their first steps to form an economic United States of Europe. With a potential market comparable to the United States of America, the countries foresaw a good economic future. In order to become a part of this large potential market Sprague Electric entered into its first European venture in 1956 with the acquisition of a small, but technically proficient, capacitor manufacturing company located in Milan, Italy. This company was known by the initials C.R.E.A.S. (Construzioni Elettriche Applicazioni Speciali) S.p.A.

In early 1960, Sprague Electric purchased the remaining minority holding of CREAS and became sole owner, and the company was renamed Sprague-CREAS. The soundness of this management decision by Sprague Electric officials has been reflected by increased production and sales and the new addition to Sprague-CREAS planned early in 1961 and completed in June 1963. Sprague-CREAS has not only become a major contributor to the European Common Market but has also become a major supplier of the European Free Trade Area as well.

Following a long established policy of Sprague Electric, each foreign manufacturing plant is primarily formed to meet local market needs. This policy results in increased productivity and returns a profit to Sprague Electric that would not otherwise be available. Increased productivity in the local foreign plant also materially increases the export of other components which Sprague Electric manufactures but which it is not practical to manufacture abroad. In addition information is often acquired leading to research and development of new product lines both for foreign export and United States consumption.

It is interesting to note that exchanges of information between this foreign subsidiary and Sprague Electric have benefited the U. S. A. operations, since some of their

CREAS Manufacturing facilities



developments have proved of value to our domestic operations.

Under the continued administration of Mr. Giacomo Giacomello, founder and Managing Director of CREAS, aluminum electrolytic capacitors are still a major product but they have been enhanced by Sprague Electric types more suitable for application to the needs of the computer industry, other highly technical industries, and the military. During the past year, type 150D and 160D solid tantalum capacitors have been manufactured with the expectation of a more extensive tantalum line in the near future.

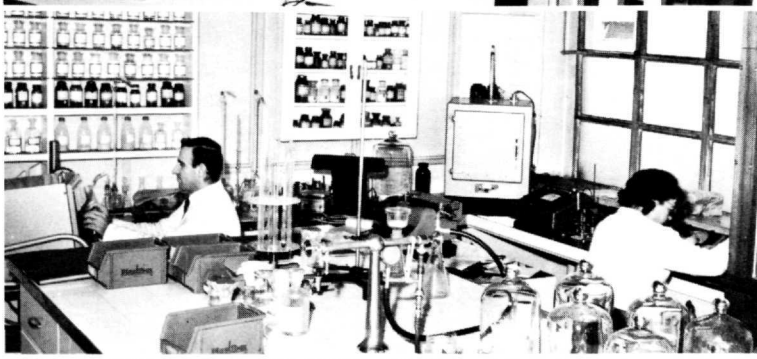
Many of the technical and professional personnel of Sprague-CREAS have spent time at Sprague Electric in North Adams, both to keep up-to-date with technical developments and to exchange ideas. The engineering staff are well recognized in their professional field and many have advanced degrees. The members of top management are not only ably skilled technically, but also in languages. All top managers speak two, and many four foreign languages which aids substantially in the conduct of our Sprague-CREAS operations.

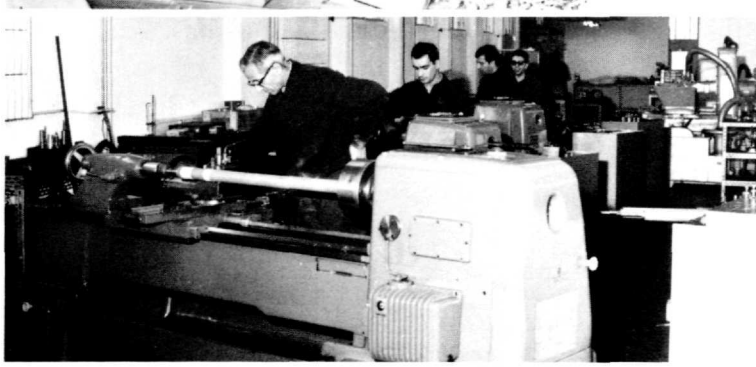
Sprague-CREAS is located about 15 miles from the center of Milan in northern Italy. Milan is the industrial center of Italy and is second in size only to Rome, with a population of approximately 2½ million people. It is located very close to the well-known Port of Genoa, and is served by two major airports: Malpensa and Linate.

Our plant in Italy employs approximately 250 people. Initially sales of Sprague-CREAS products were geared to the Italian market, but the export business to other parts of Europe is increasing and expected to continue to increase.

We feel that the contributions of Sprague-CREAS have been significant and we confidently look forward to the continued success of our first European operation.

CREAS Manufacturing facilities





An interview with WILLIAM J. NOLAN

"My philosophy is based on the principle that what is good for employes is good for the Company, and that while economics is important, it is equally necessary to constantly consider the human side of the enterprise."

It has long been an accepted fact at Sprague Electric that among his many other significant contributions to the growth and success of the Company, the basic human philosophy of William J. Nolan, Senior Vice President, Legal, was the foundation upon which our current Industrial Relations programs and activities have been patterned.

During the privilege of a recent interview with Mr. Nolan on the occasion of his retirement from day-to-day active service at the end of this year, he reminisced about the early days of the Company in addition to expressing a few of his basic concepts. His fundamental ideas and his inherent respect for people have proved to be a strong and needed guide from those early days to the present, and fortunately for the future, in his capacity as Consultant-Director.

"I remember being there back in 1926 when Sprague Specialties was incorporated in Quincy, Massachusetts and the Board of Directors consisted of Robert C. Sprague, the Company's founder and Chief Executive Officer; William Hurley; Fred Lally and myself. By 1927 we had a total of 27 employes. From that day I have considered that good relations between employes and management, two important elements in effective industrial relations, are paramount."

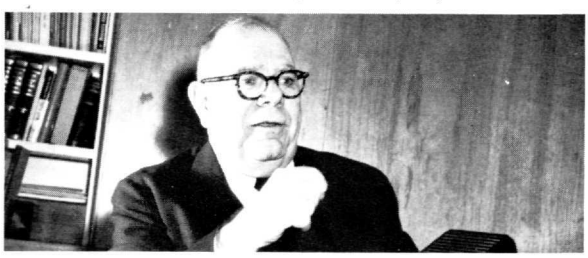
During those early years, Mr. Nolan was the guiding legal representative, one of the original incorporators, and a personal contributor to help finance the fledgling concern. The first few years in Quincy proved to be so successful that additional space was required. It was at that time that the move was made to North Adams and again Mr. Nolan, who became Vice President in 1929, was instrumental in securing the needed financial backing as well as handling the involved legal problems represented by the move. As is undoubtedly the case for most companies, a period of extreme difficulty was encountered by Sprague Specialties toward the end of 1931. The Company was faced with problems of staggering proportions, even with sales at an all time high. Mr. Nolan worked untiringly with Mr. R. C. Sprague during the difficult days that followed to secure extensions on our bank loans and with our principal merchandise creditors, literally traveling from door-to-door to plead our case. During the hard years that immediately followed, our loans were repaid and the Company emerged a well organized and financially sound business.

"We do not work alone. We work with other people. I have always liked people and I could not have accomplished anything without those who were with me in any of my activities in the Company." Characteristically Mr. Nolan cited the members of management individually with due credit to their interdependence with him in the organization that, he said, enabled all of us to achieve together our success in the component industry.

"In these terms, I am proud of what we have accomplished through the years in being a profitable company, which is the best company from any standpoint including employes, stockholders, the community, and our customers." "Within this framework of profitability", Mr. Nolan continued, "I am also proud of what we have accomplished in reference to being one of the first area concerns to consider such policies as paid vacations, and group insurance, for example."

"There are, of course, many other activities today with which we are familiar, such as our safety program, our training efforts that formally started in the war years, along with job evaluation, and our policies on seniority and layoff that had their early beginnings then, and many others too numerous to mention."

"Four basic elements of effective and sound relations in industry," Mr. Nolan stated in response to a question, "are reflected in the good relations between the Company and these five groups: employes, management, the community, our customers, and our stockholders. Any action by an industrial concern must be planned with these five groups in mind, both in terms of the economics of the situation and also in regard to the well being of the people involved."



"I am confident," Mr. Nolan concluded, "in the future of the profitability and the stability of our Company as a whole, and of the increasing awareness and capability of our industrial relations concepts to assist in this progress and goal. I base my confidence in my esteem for, and my knowledge of, our forward looking management."

EXCERPT FROM
AMERICAN AV
Editors
compa

HOW WE WILL GET

I A SPEECH BY L. L. WAITE, SENIOR VICE PRESIDENT, NORTH
IATION, INC., BEFORE THE ELECTRONIC ANALYSTS OF BOSTON

note: Sprague Electric supplies many vital high reliability
nents for our major space programs.

TO THE MOON

THE EFFORT to land three men on the moon and bring them back to earth alive is a mammoth undertaking. It will be the third step in a program of a logically graduated series of manned space flights beginning with project Mercury. The Mercury Atlas which sent the first Americans into orbit around the earth was 90 feet high and was powered by a North American Rocketdyne Division propulsion system of 390,000 pounds thrust.

The next step in the nation's manned space flight program after project Mercury is the Gemini spacecraft, which will carry two astronauts into earth orbit using Titan II as the launch vehicle. The Titan II-Gemini combination stands 110 feet high. The two astronauts will navigate the Gemini in orbit and rendezvous with an Agena B rocket previously launched into orbit by an Atlas missile. This rendezvous in space is a most important preliminary experiment for the success of Apollo. The Rocketdyne Division is developing the small space engines used for flight control of the Gemini capsule. Space Division is developing the paraglider to be carried in the Gemini capsule and help return it to earth.

Tremendous Launch Power Needed

The third step is the Apollo program. A Saturn V vehicle will be used to send three astronauts to the moon. The 372-foot Saturn V will be as high as a 30-story building and will weigh 3,000 tons, or as much as a nuclear submarine or two dozen jet airliners fully loaded with passengers, cargo, and crews. To launch such a tremendous weight, Rocketdyne is building the 1.5 million-pound-thrust F-1 liquid fuel engine. Five of these will be clustered to provide the 7.5 million pounds of thrust needed to do the job. Saturn V's three booster stages (S-IC, S-II, and S-IVB) and three space modules will be assembled for flight at Cape Canaveral. The hangar where Saturn V will be housed and made ready will be the biggest building in Florida – 524 feet high and 674 feet long.

Several initial experimental firings of the various stages of Saturn V into earth orbit will precede the planned lunar flight. The astronauts will practice rendezvous techniques in the earth's orbit. If all these experiments are successful, then the flight to the moon will follow. Let's imagine that all these difficult experiments are successfully behind us, and we are ready to send man to the moon.

The Saturn V, including its 400-foot high umbilical tower, will be transported from its vertical assembly building on special equipment consisting of eight giant caterpillar tracks supporting a platform half the size of a football field. Fully fueled, Saturn V will weigh six million pounds. Weight has been a critical design consideration throughout the program; for every pound added to the Apollo which makes the complete Apollo voyage more than 500 pounds of additional booster fuel are needed.

Once in place, everything must be checked and rechecked for the up to 14-day round trip. There are many critical things to be checked out, for Apollo must move in space no faster than 36,500 feet per second, nor slower than 35,000 feet per second at injection. The moon itself is moving 3,300 feet per second and rotating around the earth once every 27.3 days. At the same time both the earth and the moon are moving at almost 100,000 feet per second around the sun.

When the zero hour comes, the five powerful F-1 engines in the 138-foot high first stage will be fired. Each engine will be drinking a liquid fuel mixture of kerosene and liquid oxygen at the rate of 1000 gallons per second. The liquid oxygen is at minus 300 degrees Fahrenheit. Turbo-pumps equal in power to 30 diesel locomotives working together will pump the fuel into the engines. In about 120 seconds of operation the first stage will burn 2,100 tons of fuel. The volcanic force burning like an inferno at 5,000 degrees Fahrenheit will generate the equivalent power of 85 Hoover Dams.

This powerful force will lift the Saturn V to an altitude of approximately 30 miles. The first-stage booster will be jettisoned, and will take over the boosting job, burning liquid hydrogen and liquid oxygen and pushing the spacecraft higher and faster. The second-stage, S-II, is being designed by North American Space Division.

On the nose of the Apollo command module is the escape tower with its own engine. If anything goes wrong in the beginning, the escape tower's engine will be fired to lift the Apollo command module away from the rest of the vehicle. The command module with its crew of three astronauts is then returned safely to earth by parachutes contained in the module. If there is no emergency, the escape tower is jettisoned a few seconds after the second stage booster is ignited.

The Saturn S-II with its five J-2 engines develops one million pounds of thrust and will send Apollo to an altitude of about 99 miles, where the second stage will be jettisoned like the first. By this time the spacecraft will be at orbital altitude and traveling at near orbital speed. A final push by the Saturn S-IVB third stage powered by a single J-2 engine will put the spacecraft into an orbit around the earth at 17,500 miles per hour. Then the J-2 engine will be shut off, and the spacecraft will begin to coast around the earth. Meanwhile at the ground-based mission control center (located at NASA's Manned Spacecraft Center, Houston), computers will calculate the Apollo's trajectory and orbit to determine the time when the S-IV's engines must be fired again to push the spacecraft to the escape velocity of 25,000 miles per hour and send it on an accurate course to the moon.

Freedom in Flight

While Apollo is orbiting the earth and the J-2 is shut off, the astronauts will be able to get up and move around. They will make navigation sightings and will have primary control of the spacecraft. At the proper instant the J-2 engine of the S-IV will be started again to provide the thrust necessary to break away from the earth's orbit and start the 70-hour trip to the moon. Before they reach the moon the astronauts will have another difficult maneuver to perform – turning their command module around so that its nose is attached to the top of the lunar excursion module. Two of the crew members will transfer from the command module to the lunar excursion module. This docking maneuver can be accomplished either by mechanically swinging the "Bug," as the lunar excursion module is called, around to the command module hatch or, more probably, by flying the command and service modules out a short distance, turning them around, and then bringing them back to connect with the lunar excursion module. Previous docking and rendezvous experience will be gained through the Gemini program in an earth environment. When the Apollo is on the correct course the S-IV will be jettisoned.

Apollo must move toward where the moon will be 70 hours from now; the earth is moving 66,600 miles per hour relative to the sun, and the speed of the moon is 2,300 miles per hour relative to the earth. During its translunar flight, the spacecraft constantly changes speed under the influence of gravity, but averages about 5,500 miles per hour. Accuracy and timing are critical.

The service module engine can be used for mid-course corrections to insure that the spacecraft will intercept the moon at the right point.

The vehicle speeding toward the moon consists of the command module, service module, and the lunar excursion module. It has all the equipment to reach the moon, land there, and return to earth.

An Eight Hour Shift

The astronauts will also move around during this phase of the flight. They will communicate with the earth via radio and television. They will eat special dehydrated foods. They will sleep. Liquid hydrogen and oxygen flow from two separate tanks into a fuel cell battery to produce electricity. This liquid then leaves the battery and flows into a cooler to become the astronauts' drinking water. The men will probably work eight-hour shifts in the shirt-sleeve environment maintained in the capsule.

As the moon is approached its gravity exerts greater and greater force. Calculations from computers on earth and on board the spacecraft will determine when the service module engine must be fired as a retrorocket to slow the spacecraft down and put it in orbit around the moon about 80 miles above its surface. In this orbit the spacecraft will circle the moon once every two hours at 3,500 miles per hour.

When a correct lunar orbit is achieved, two astronauts will transfer to the lunar excursion module. They will

Continued on page 16

AVIATION DEPARTMENT HONORED

Robert C. Sprague, Jr. (seated 2nd right) discusses flight plans with John H. Winant (seated 2nd left) and the four other pilots honored by NBAA. Seated are: (l to r) William Benedetti and Robert Reynes. Standing: Vassily de Samsonow and Edward Harkin.

Sprague Electric Aviation Department, Robert C. Sprague, Jr., Senior Vice President, Industrial Relations, and four Sprague pilots were honored recently by the National Business Aircraft Association for their accident-free flying records. Mr. Sprague, Jr. previously served as a Director of NBAA until he resigned in 1957 to accept a Sloan Fellowship at Massachusetts Institute of Technology. In addition to these awards, John H. Winant, Corporate Director of Industrial Relations, was elected to his third term as President of NBAA. Mr. Winant was appointed to fill out Mr. Sprague's term as Director and Treasurer in 1957 and in 1959 was elected Executive Vice President of NBAA. In 1961 he was elected President and has been reelected each year.

Organized in 1951 under the guidance of Mr. Sprague, Jr., the Aviation Department has accumulated a total of 3,279,856 miles without accident to equipment or personnel as of the award reporting date of June 30, 1963. Our accident-free record places Sprague Electric among the top 20 companies in the nation in the safe operation of business aircraft. Sprague Electric was one of 80 companies to receive an award at the Annual Meeting and Forum of NBAA held at Houston, Texas in late September.

Pilots receiving first awards for over a half million miles of accident-free operation of business aircraft were Mr. Sprague, Jr. with 516,650 accident-free miles, and Edward Harkin for 576,645 accident-free miles as a pilot in business aircraft flying operations. Vassily de Samsonow and William Benedetti, Aviation Department Manager, both received their second awards for accident-free operation — Mr. de Samsonow for 775,258 miles and Mr. Benedetti for 715,836 accident-free miles. Robert Reynes joined the million mile group with his record of 1,006,109 miles of accident-free operation in business aircraft flying operations. In addition to his certificate, Mr. Reynes received an engraved wall barometer. Only miles flown in business operated aircraft count in accumulating accident-free miles.

Sprague Electric business aircraft fulfill a vital need in the Company for the transportation of personnel, customers, products and materials. There are approximately 28,000 private business aircraft in the United States compared to approximately 2,000 in the airlines combined. In addition commercial business aircraft fly approximately 2,000,000 more miles per year than the airlines.

The National Business Aircraft Association is a national trade organization with headquarters in Washington, D. C. and a membership comprising some 500 companies which own and operate aircraft in support of their business activities. Sprague Electric has been a member of NBAA for over ten years.

The organization provides national representation to various local, state, and national governmental bodies and agencies, including the Federal Aviation Agency and the Civil Aeronautics Board, and in addition makes available to members the latest technical and management information related to aircraft. It also disseminates and helps shape current information on regulatory matters affecting air space and air traffic control, and also serves as a forum for interchange of information with airframe and airborne electronics manufacturers on availability of new techniques and equipment.

The current fleet of Sprague aircraft

We visit the Chicago

Sprague Electric Company's Chicago Sales Office was opened early in 1953 at its present location, 5942 West Montrose Avenue. Prior to that time Samuel Darmstader and Ansel G. Ostrand had handled our accounts in the area along with one other manufacturer. With Mr. Darmstader's death in the Fall of 1952, and in keeping with the established Sprague policy, the decision was made to have an exclusively Sprague sales office. In line with this decision it was agreed to combine Sprague Electric and Sprague Products sales activities in one location. The Chicago Sales Office in its present form thus came into being on March 1, 1953 with Mr. Ostrand as Manager and Irving J. Kahan as Co-Manager.

With the formal opening of the office, Louis Shuey and a secretary were added to the staff. Mr. Shuey's excellent technical talents were drawn upon to augment the best efforts of a growing sales organization and under him most of the present day procedures of the office took shape and for the most part are still followed today.

As our product line continued to expand the clerical staff also increased to a total of three. On January 1, 1955 Edwin Pionkowski, affectionately known as the "Ambassador" in some quarters, joined the staff. With the continued expansion of sales the office duties also became more numerous and another man with technical and sales ability was added to complement and assist the sales staff and to relieve the managers of the mechanics related to running an office. John Lay was the choice and has continued to handle this post with ability since that time.

In the Spring of 1960 a void was left in the office force with the transfer of Louis Shuey to the West Coast. Finding a suitable replacement proved to be a difficult task but the addition of Larry Cox in November 1960 was a happy choice. Larry has done a remarkable job ever since.

Sprague Products' sales also increased at a substantial rate during this period and in the summer of 1959 Irving Kahan added Joel Wasserman to his staff as an assistant. This association turned out very well indeed if citations for exceeding quotas are any criteria.

Between January 1961 and December 1962 four additional men were operating out of the Chicago office as Product Specialists. They included Robert Farnsworth for resistors, Earl Johnson for Special Products, Richard Herrell for transistors, and Bernard Kuhse for interference filters. Mr. Farnsworth and Mr. Johnson have since resigned.

Sales Office

Mr. Ostrand attended the University of Illinois, School of Commerce and has been associated with Sprague since 1931. In the early days of the Company he not only sold our products but designed circuits, which of course included our components, for the manufacturers. This close relationship helped to increase our sales and our customers.

Mr. Kahan joined the Company as a Sales Representative in 1927. After a short leave he rejoined Sprague and with Harry Kalker pioneered the sale of Sprague capacitors through a nation-wide chain of distributors. For several years he was the lone travel emissary of Sprague Products Company. Prior to joining Sprague, Mr. Kahan, who attended New York University and Massachusetts Institute of Technology, had been employed by the Western Electric Company.

Mr. Pionkowski joined Sprague Electric at our Wisconsin facility, Sprague of Wisconsin, Inc. as a Sales Engineer. He had previously attended the University of Wisconsin and graduated from the U. S. Naval Academy with the Class of 1940.

Mr. Lay attended Craine College, School of Civil Engineering and also received additional training through RCA Institutes. Prior to joining Sprague Electric he worked for Walker Jamieson Company, Chauncey, Inc., and Consolidated Edison.

Mr. Cox attended the Illinois Institute of Technology, School of Electrical Engineering and had eight years of background in production and design of capacitors and high voltage power supplies. He served in the Naval Air Force from 1943-1946.

Mr. Wasserman is a graduate of Chicago Technical College with a B.S. degree in electrical engineering, and also attended Wright Junior College. He is a member of the National Guard and is a sports fan being particularly interested in hockey and football.

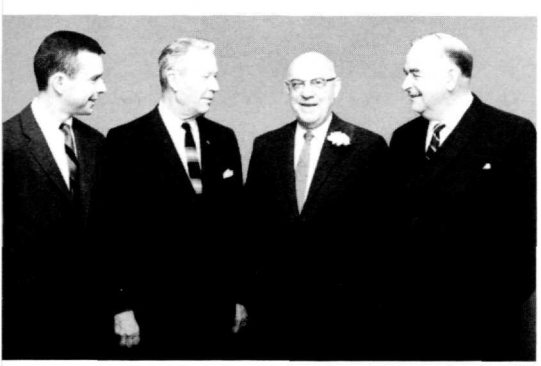
Mr. Herrell, who joined the Company in 1961, is a graduate of Devry Technical Institute. His hobbies include hunting and fishing.

Mr. Kuhse attended Iowa State University, School of Mechanical Engineering and the American Institute of Technology where he received a B.S. degree in electrical engineering. Prior to joining Sprague Electric he was associated with Hallicrafters from 1942 to 1945. Mr. Kuhse served as an Air Force Flight Engineer from 1942 to 1945.

1-Mr. Kahan (seated) and Joel Wasserman discuss a Sprague Products TK-25 Capacitor Kit.
2-A. G. Ostrand and Ed Pionkowski reviewing an Engineering Bulletin.
3-Bernard Kuhse and Larry Cox using the 1W1 Capacitance Bridge.
4-John Lay and Earl Johnson checking a customer's order.
5-Shirlee Nicodemus and Eileen Choyinski opening and sorting mail.
6-Betty Walsh and Larry Cox assembling Engineering Bulletins for a customer.

Dr. John L. Sprague (right) presents Dr. Lazier one of several gifts given him by his associates at the Retirement Banquet.

Mrs. Lazier admires Dr. Lazier's ten year service pin which had been presented to him a few minutes earlier by Robert C. Sprague (right). Dr. John L. Sprague waits to extend his congratulations.



Dr. John L. Sprague, Robert C. Sprague and Frederick R. Lack pose with Dr. Lazier at the party.

DR. WILBUR A. LAZIER to RETIRE on DECEMBER 31

Dr. Wilbur A. Lazier, Senior Vice President in Charge of Engineering, who will retire on December 31, was honored at a retirement party held at the 1896 House in Williamstown, Massachusetts.

Dr. Lazier joined Sprague Electric in July 1953 and during the ten year period in which he has been associated with the Company there has been a tremendous change, not only in the technical aspects of our business but in its very nature.

Speaking at the dinner, Dr. John L. Sprague, Senior Vice President and Co-Director of Engineering, said, "The new Research Center is due in large part to Dr. Lazier's efforts, as is the present separation of research and engineering into two distinct but closely coordinated operations."

"Many of the products which are the mainstays of our present business or hold great promise for the future", Dr. Sprague continued, "have been developed under Dr. Lazier's able leadership. These include many of our complex components and during this same period, basic studies were begun which were to lead to our present work on silicon PLANAR transistors and silicon based microcircuits."

Also congratulating Dr. Lazier was Robert C. Sprague, Chairman of the Board and Chief Executive Officer, who emphasized the important role Dr. Lazier undertook when he joined the Company as Technical Advisor in 1953.

Dr. Sprague presented several gifts to Dr. Lazier and a silver pin to Mrs. Lazier.

Dr. Lazier was born in Rochelle, Illinois and received his B.S. degree in chemistry from the University of Illinois in 1922, his M.S. in organic chemistry from the University of Wisconsin in 1923, and his Ph.D. in organic chemistry two years later from the same institution. He then joined E. I. duPont de Nemours and was in their central chemical department from 1925 to 1944.

While at duPont he developed the first practical catalyst for the high pressure synthesis of methanol and higher alcohols, discovered the process which formed the basis for the first synthetic detergent industry, and played a key role in the development of both nylon and orlon.

From 1942-1944 he was also a member of the National Defense Research Committee of the Office of Scientific Research and Development. In 1944 Dr. Lazier was responsible for the creation of the Southern Research Institute in Birmingham, Alabama and served as its first director until 1948 when he joined Chas. Pfizer & Company as director of chemical research and development.

Dr. Lazier has written many scientific papers and has been awarded over 100 United States patents. He is a member of many professional societies and was awarded the Modern Pioneer Award by the National Association of Manufacturers in 1940. In 1946 he received the Herty Medal in recognition of his organization of the Southern Research Institute and in 1947 he received the War and Navy Department Certificate of Appreciation for Scientific Services during World War II.

THE MESSAGE OF MEDIC-ALERT

An unconscious pedestrian is found in the middle of the night on the street of a large city. He is obviously in a serious condition. A policeman on the scene bends over the victim to loosen his clothing when he discovers the Medic-Alert emblem around his neck. His identity is immediately established and the fact that he is a diabetic and requires special medical attention. A collect telephone call to Medic-Alert headquarters gives all the pertinent information to the attending emergency doctor in a matter of seconds.

The Medic-Alert Foundation, a charitable, non-profit organization, hopes to educate and encourage the public to wear these identifying emblems. Like many such lifesaving aids, Medic-Alert is the direct result of a near tragedy in the family of Dr. Marion C. Collins of Turlock, California. Seven years ago his daughter, Linda, then fourteen years old, was given a shot of tetanus antitoxin which nearly took her life. Her father was extremely concerned, not only about his daughter, but about the countless thousands of others who have special medical problems and could be killed by a dose of medication.

Originally started in California in 1956 the program was launched to inform doctors, hospitals, police and firemen, and first aid units to look for the medical tag.

According to medical statistics an average of one in every family has a medical problem. The Foundation maintains a central file and accepts, on a 24-hour basis, collect calls from anywhere in the world, relaying information from the file pertaining to the wearer. Each emblem is registered and the serial number is also engraved on the reverse side as is the telephone number of the central file. (Phone 209-634-4917). The cost of membership is $5 which is the only charge for your entire lifetime.

Some of the medical conditions which should be "tagged" include: Epilepsy, diabetes, heart conditions, neck breathers, allergy to antibiotics, Rh negative blood, and contact lenses. If you need to have any of this information available in an emergency, why don't you apply for your Medic-Alert emblem now. Application blanks are available in the Dispensary or the Industrial Relations Office.

detach the Bug and use one of its two engines to put themselves into an elliptical orbit with a period equal to that of the command module. This means that once every two hours the lunar excursion module will pass near the command module as the two orbits cross. At the closest point of the elliptical orbit to the surface of the moon – about 50,000 feet – the Bug will descend to within a few feet above the lunar surface, probably in the area of the Sea of Tranquillity. The astronauts have approximately two minutes to decide whether to land or rendezvous with the command module.

Gaining Information Now

The Bug most likely will have long spidery legs to help it land on the moon's surface, which may be covered with a layer of dust of unknown depth and fineness. Information on this is being gained through a study of fresh volcanic ash from Alaska and Mexico. More reliable information will have been obtained before the Apollo flight from the instrumented payloads sent to the moon as part of project Surveyor.

When the astronauts land on the moon successfully, they will have reached the half-way mark of their mission. Meanwhile they will communicate with the third astronaut in the command module and with the earth.

Wearing the most protective suits ever designed and manufactured, they will leave the Bug and start excursions on foot to make scientific observations, gather samples of moon rocks, plant seismographic equipment, etc. They will carry a television camera to record their activities. Only one of them will leave the Bug at a time.

To begin the return trip the two astronauts will launch themselves from the moon by firing the Bug's ascent engine, leaving behind the other engine, its empty fuel tanks, and spider legs, using them as a launch platform. The Bug will rendezvous with the command module still circling the moon about 80 miles above its surface. To effect the rendezvous the Bug's second engine has to be fired at the right moment.

The Bug will climb on a curving course to intercept the orbiting command module. Using its reaction control system, the pilot of the Bug will make the final docking maneuver. When the two vehicles are joined, the two men will rejoin the third in the command module.

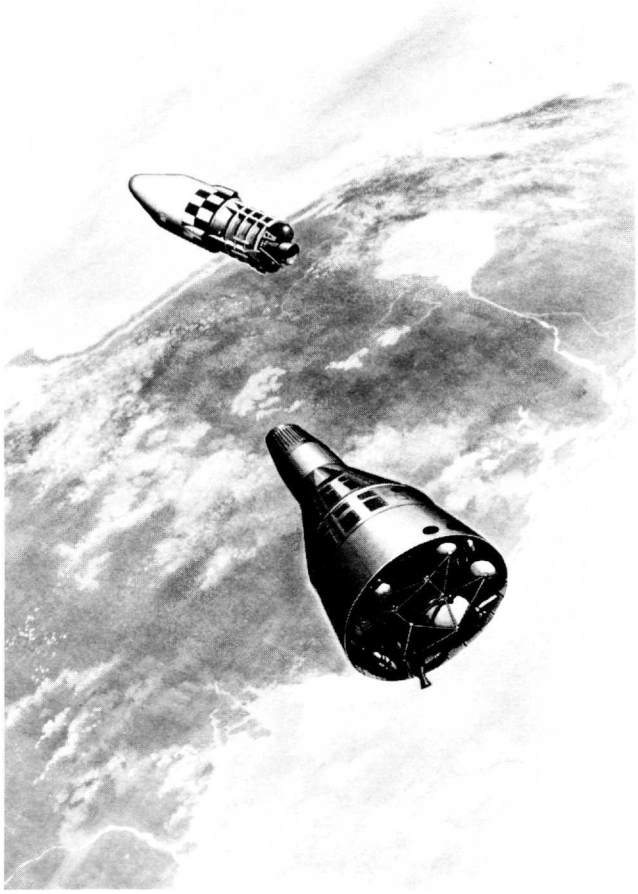
The lunar excursion module will be dropped off in the lunar orbit, and returned to earth in the command module will begin. The service module's engine will be fired, pushing the spacecraft at about 5,500 miles per hour away from the moon, whose gravity is 1/6th that of the earth. The planned return trip takes 60 hours. As Apollo approaches the earth, the spacecraft's speed will increase to 25,000 miles per hour because of earth's gravity.

There is a 40-mile deep corridor in which the spacecraft must enter the earth's atmosphere, which starts at about 400,000 feet. Instead of carrying retrorockets that take up extra space and weight, the spacecraft will use the friction of the atmosphere to slow down.

A Hot Re-entry

When the spacecraft is on course for successful re-entry of the earth's atmosphere, the service module will be jettisoned. Using pitch control jets, the spacecraft commander will turn the blunt heat shield forward so it absorbs the fiery heat as Apollo plunges into the heavy atmosphere of earth.

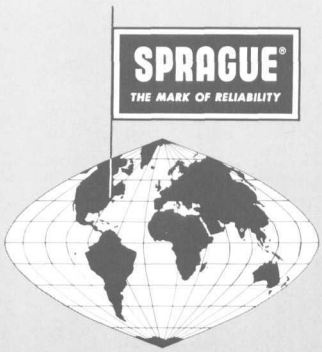
When entering the atmosphere, the Apollo will be four times as hot as the Mercury capsule, but its speed will be only 50 per cent faster. Temperatures on the surface of the heat shield will reach an estimated 5,000 degrees Fahrenheit. The command module is like an airplane wing with certain aerodynamic lift capabilities, so that the pilot can maneuver his spacecraft to stay in the narrow re-entry corridor and select his landing point. He can guide the spacecraft to a selected landing area, either on sea or land as far as 5,000 miles away. At 25,000 feet altitude, Apollo's drogue parachutes will pop out, deploying the three main parachutes at 15,000 feet to lower the spacecraft gently to the ground.



Miles above the earth, the two-man GEMINI capsule in the foreground moves into position for an orbital rendezvous attempt with the unmanned Agena B spacecraft.

Photo courtesy of Aerospace Division of Martin Marietta Corporation

I
love
a star,
a wreath,
a shopping
list, a crowd,
a gift, a time
of worship, a toy,
a child, a colored
ball, a party, a kiss,
a family together, the
sound of laughter, turkey
'n mince pie, joy and peace,
a tree of lights, the glow of
candles, the faith of a child,
the sound of bells, an angel's song,
a season of wonder and togetherness,
★ **a** ★
world
★ **at** ★
peace
filled with love
and good will
toward all
mankind.


SPRAGUE®
THE MARK OF RELIABILITY